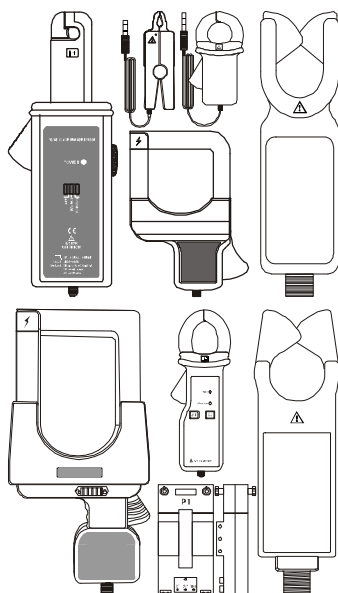


ETCR[®] CLAMP LEAKAGE CURRENT SENSOR

ETCR 007AD
ETCR 008
ETCR 030
ETCR 030D
ETCR 030D1
ETCR 035AD
ETCR 040
ETCR 033H
ETCR 048H
ETCR 080
ETCR 080A
ETCR 080D
ETCR 085K
ETCR 148
ETCR 148A



<http://www.etcrc.com>

MANUAL

ETCR Electronic Technology Company





Warning




Thanks for your purchase of Leakage Current Sensor/Current Sensor of our company. For better use of the product, please make sure:

---to read this user manual in details.

---to abide by the safety regulations and precautions strictly.

- ⌚ Under any circumstance, it shall pay special attention on safety in use of this sensor.
- ⌚ Pay attention to words and symbols stick on the panel.
- ⌚ Keep the pliers clean, maintenance regularly.
- ⌚ Stop using the sensor when there is a rupture or break.
- ⌚ For high voltage sensors, if the voltage of tested circuitry has exceeded 600V, it must be used by connecting with an insulation rod.
- ⌚ The operator must get strict training and the relevant certification.
- ⌚ Please don't keep or store the sensor in the spot with high-temperature and moisture, or condensation, and under direct daylight radiation for a long time.
- ⌚ For the sensors that need battery power supply, please remove the battery if you expect not to use the sensor for a long time, and take note of the polarity when replace the battery.
- ⌚ Replace battery in time when the battery voltage is low.
- ⌚ In case of explosion, please don't remove or replace the battery in dangerous places.
- ⌚ For the sensors that need external power supply, please first confirm the polarity of power supply.
- ⌚ This sensor is only to be used, disassembled, and repaired by qualified personnel with authorization.
- ⌚ When it may cause hazard by continuous use for the reason of the sensor itself, it shall immediately stop using it and deposit it at once, leaving it for disposal by authorized agency.
- ⌚ “” in the manual is the safety warning sign, the contents of this manual must be followed for safe operation.
- ⌚ “” and other safety signs, the contents of this manual must be followed for safe operation.

	Clamp positive line and negative line together to measure leakage current of this DC line. (Note: 2 wires)
	Clamp positive line or negative line separately to measure the DC current of this line. (Note: single wire)
	Clamp live wire or null line separately to measure the current of this line. (Note: single wire)
	Clamp live wire and null line together to measure leakage current of single phase. (Note: 2 wires)
	Clamp earth wire to measure grounding line leakage current of electrical equipment. (Note: single wire)
	Clamp three wires together to measure the leakage current of three phase three wires. (Note: 3 wires)
	Clamp four wires together to measure the leakage current of three phase four wires. (Note: 4 wires)

The sensors output a current signal, and the secondary current can be transferred to voltage output by parallel connecting a load resistance R_L . For example, coils turn 1000:1, when input 1000A current signal, the secondary current will be 1A, if R_L is 1Ω , it will get 1V voltage output. That means, output voltage is in proportion to the input as 1mV/A. Please refer manual for the value of R_L .

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ETCR007AD AC/DC Clamp Leakage Current Sensor

I Introduction

ETCR 007AD AC/DC Clamp Leakage Current Sensor is designed for measuring AC/DC current and leakage current under 600V line voltage, by adopting the latest CT technology and digital integrate technology. The small clamp is suitable for line densely places (electric power measurement system, the high speed rail system, car circuit overhaul, and so on), non-contact measurement, to ensure safe operation. It is small, with high precision, stable performance, can be connected with phase detection analyzer, industrial control equipment, data recorder, oscilloscope, electric power quality analyzer, high precision multi-meter. The sensor is widely applied in those fields as electricity, communications, meteorology, railroad, car industry, oilfield, construction, measurement, scientific & research teaching institutes, industrial and mining establishments.

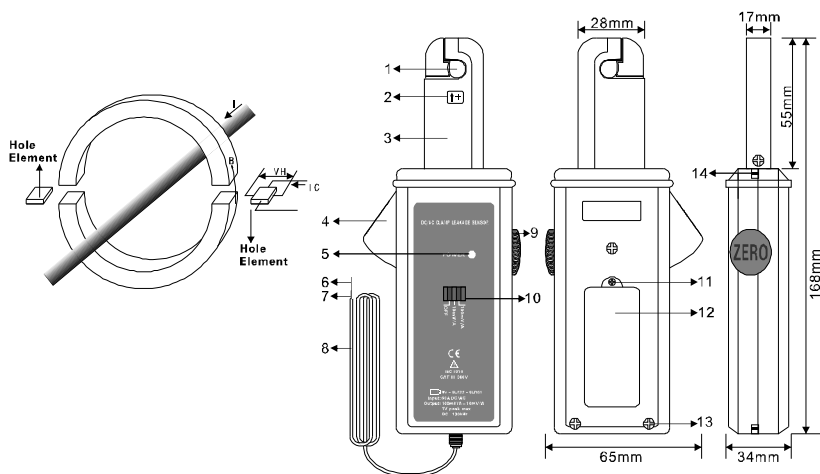
II Technical Specifications

Function	Measurement of AC/DC current, leakage current
Power Supply	Zn-Mn dry battery, 6F22, 9V. Continually using for 100 hours, connecting external power supply is also available for long time using.
Test Mode	Clip-on CT, non-contact measurement
Clamp Size	φ7mm
Input Range	0mA-60.0A AC/DC
Output Voltage	10mV/A;100mV/A(corresponding)
Output Range	1V peak max
Resolution	1mA AC/DC
Accuracy	±3%FS(23℃±5℃, below 5%rh)
Phase Error	≤3°(AC 50Hz/60Hz; 23℃±2℃)
Calibration	Adjust ZERO to calibrate, eliminate external electric field interference
Output Wire	Core wire: signal positive output; shielding wire: signal ground
Lead length	2m
Dimension	LWH: 168mm×65mm×34mm
Frequency	AC: 45Hz-400Hz DC: DC-100kHz
Test Position	Tested wire in the jaw center
Line Voltage	AC600V
Weight	170g (including the battery)
Working Current	5mA
Working Temperature and Humidity	-10℃-50℃,below 80%rh

Limit Temperature Error	-10℃-0℃ and 40℃-50℃, within 2%rdg
Storage Temperature and Humidity	-10℃-60℃,below 70%rh
Insulating Strength	AC3700V/rms (between the alloy of the clamp and the housing)
Applicable safety rules	IEC1010-1, IEC1010-2-032, Pollution level 2, CAT III(600V)
Accessories	Sensor: 1piece; Battery(6F22,9V): 1piece; User Manual/Warranty card/ Certification: 1 copy

III. Principle and Structure

Combining partition type iron core with hall element, makes it capable of measuring AC/DC current and leakage current simultaneously. The hall element induced output a hall voltage **VH**, which is generate by the measured current **I**, so the measured current **I** can be calculated by measuring **VH**. Signal Output: 10mV/1A or 100mV/1A (input every 1A current, output 10mV or 1000mV voltage, manual shift).



- | | |
|-----------------------------------|---|
| 1. Clamp mouth (φ7mm) | 2. DC current positive input indication |
| 3. Clamp (slender shape) | 4. Toroid opening lever |
| 5. Power indicator | 6. Signal positive output |
| 7. Signal ground | 8. Output lead wire |
| 9. ZERO key | 10. Power / shift switch key |
| 11. Battery cover screw (1 piece) | 12. Battery cover |
| 13. Housing screws (3 pieces) | 14. Pendant hole |

IV Operating Method

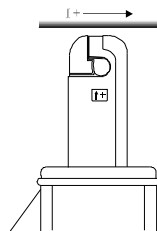
1. Start-up, Shutdown

Switch power key to 10mV/A or 100mV/A gear to start up the sensor, power indicator will light up; and switch the power key to OFF gear, the sensor will shut down.

2. Calibration

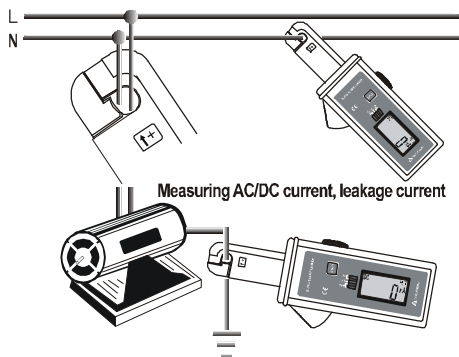
When measuring, first choose the gear, adjust ZERO key and then conduct measurement. Rational usage of this adjust zero function will make the results more accurate.

For example, after boot, before measurement, we can take the jaw close to the wire (showing as right figure), the sensor will output an inductive current (because of external electric field interference). Adjust ZERO key to calibrate, which deduct the inductive value. After measuring big current, calibration is very necessary to clear the residual magnetism.

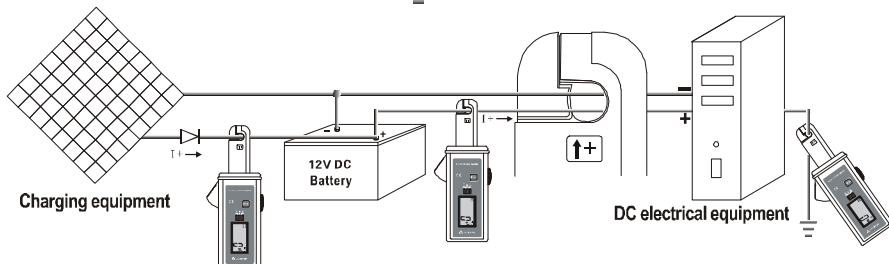


3. Measurement


- 1) Power on
- 2) Choose the gear, 10mV/A firstly
- 3) Adjust zero
- 4) Release the toroid lever to open clamp mouth and clamp measured conductors.



Measuring AC/DC current, leakage current



V Change Battery

	Please pay attention to polarity of battery to avoid damaging the sensor.
	Chang the low battery in time
	If not use the meter for a long time, please get off the battery to storage.

1) When the battery power is not enough, change it in time.

2) Shut down the sensor before opening the battery cover, please confirm the sensor is in off position, and then replace with qualified new battery. Special attention shall be paid to polarity of battery; at last, cover battery cover plate.

ETCR008 Sharp-nose Pliers Current Sensor

I . Introduction

ETCR008 Sharp-nose Pliers Current Sensor is used for measurement of AC current, leakage current, high order harmonic current, phase, power energy, power, power factor. It is portable, sharp-nose, no need to disconnect the measured circuits, non-contact, safe and fast. Suitable for narrow and line densely places, can be connected with phase detection analyzer, industrial control equipment, data recorder, oscilloscope, harmonic analyzer, electric power quality analyzer, high precision digital multi-meter, etc. Widely applied in electricity, communication, meteorology, railway, oilfield, construction, measurement, scientific and research teaching unit, industrial and mining enterprises.

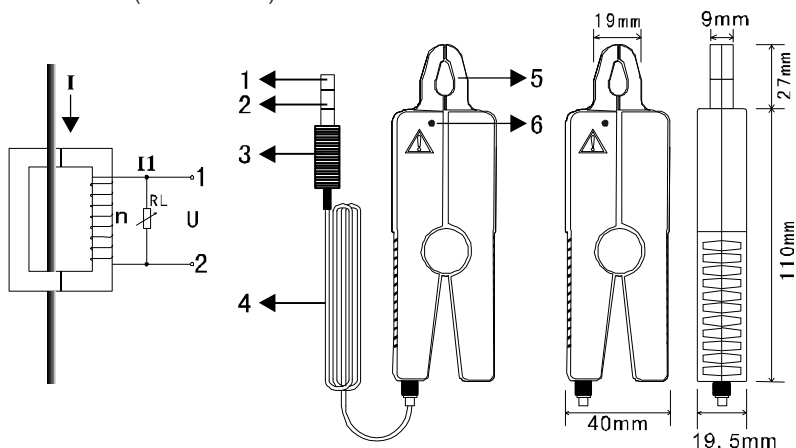
II . Technical Specifications

Function	Measurement of AC current, leakage current, high order harmonic current, phase, power energy, power, power factor
Test mode	Clamp CT
Clamp Size	Diameter 8mm
Range	0-30A
Resolution	0.1mA
Accuracy	0.5%FS(50Hz/60Hz; 23°C±2°C)
Coils Turn	2500:1(2000:1; 1000:1 is optional)
Phase Error	≤2°(50Hz/60Hz; 23°C±2°C)
Reference Load	RL: 0-300mA≤500ohm; 0-3A≤50ohm; 0-30A≤5ohm
Output Mode	Current induction output
Dimension	137mm×40mm×19.5mm
Output Interface	3.5mm audio plug
Output Wire Length	2m

Measured Wire Position	Approximately in the geometric center of the clamp
Circuit Voltage	Lower than 600VAC
Current Frequency	45H-60Hz(measured current frequency)
Frequency Characteristics	10H-100kHz
Weight	175g
Working Environment	-20℃-50℃; below 80%rh
Storage Environment	-10℃-60℃; below 70%rh
Insulation Strength	AC3700V/rms (between core and shell)
Safety Rules	IEC1010-1, IEC1010-2-032, Pollution degree 2, CAT III(600V)

III. Principle and Structure

The sensor induced output a current I_1 , the current I_1 generate voltage U on the external sampling load resistance R_L , so the measured current I can be calculated by measuring I_1 or U . Among them, $I=n \times I_1$; $U=I_1 \times R_L$. n is the coils turn (current ratio).



1. Coil tap 2. Coil tap 3. Sensor output plug (3.5mm audio plug)
 4. Output lead wire 5. Pliers
 6. Direction symbol (indicate the same polarity when measuring phase)

ETCR030 High Accuracy Clamp AC Leakage Sensor

I. Introduction

ETCR030 High Accuracy Clamp AC Leakage Sensor is used for measurement of high accuracy AC current, leakage current, high order harmonic current, phase, power energy, power, power factor. Adopt the latest CT technology. It is portable, clamp design, no need to disconnect the measured circuits, non-contact, safe and fast. The clamp core is made of special alloy, adopt the double magnetic shielding techniques, can almost shield the influence from external magnetic field, to ensure the high precision, high stability and high reliability of perennial uninterrupted measurement. It can be connected with phase detection analyzer, industrial control equipment, data recorder, oscilloscope, harmonic analyzer, electric power quality analyzer, high precision digital multi-meter, etc. Widely applied in electricity, communication, meteorology, railway, oilfield, construction, measurement, scientific and research teaching unit, industrial and mining enterprises.

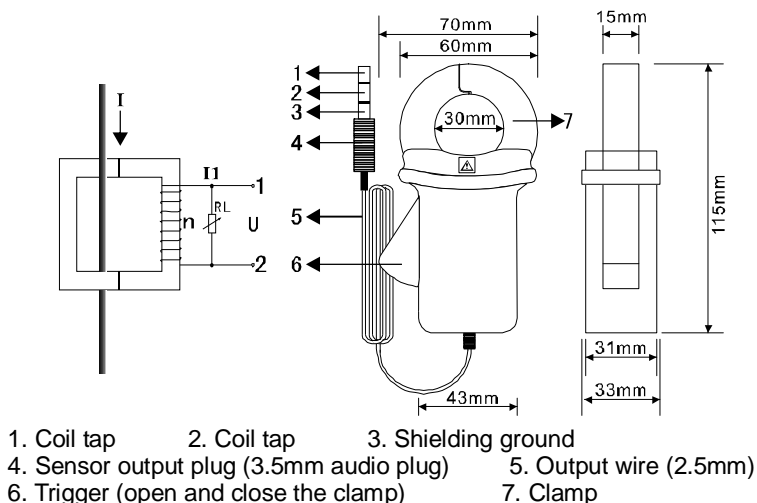
II. Technical Specifications

Function	Measurement of AC current, leakage current, high order harmonic current, phase, power energy, power, power factor
Test mode	Clamp CT
Clamp Size	25mm×30mm
Range	0-60A AC
Resolution	1uA AC
Accuracy	±1.0%FS(50Hz/60Hz; 23°C±2°C, below 70%RH, keep the wire be in the center of clamp)
Coils Turn	1: 800
Phase Error	≤2°(50Hz/60Hz; 23°C±2°C)
Reference Load	RL: 0-600mA≤300ohm; 0-6A≤30ohm; 0-60A≤3ohm
Output Mode	Current induction output
Dimension	115mm×70mm×33mm
Output Interface	3.5mm audio plug
Output Wire Length	2m
Electric Field Interference	About 5mA when the external electric field 100A, 10mm nearby
Measured Wire Position	Approximately in the geometric center of the clamp
Current Frequency	45Hz-60Hz (when measuring big current)
Frequency Characteristics	10Hz-100kHz

Weight	180g
Working Environment	-20℃-50℃; below 80%rh
Storage Environment	-10℃-60℃; below 70%rh
Insulation Strength	AC3700V/rms (between core and shell)
Safety Rules	IEC1010-1, IEC1010-2-032, Pollution degree 2, CAT III(600V)

III. Principle and Structure

The sensor induced output a current I_1 , the current I_1 generate voltage U on the external sampling load resistance R_L , so the measured current I can be calculated by measuring I_1 or U . Among them, $I = n \times I_1$; $U = I_1 \times R_L$. n is the coils turn (current ratio).



ETCR030D1/030D Clamp DC Leakage Current /Current Sensor

I . Introduction

ETCR030D1/030D Clamp DC Leakage Current/Current Sensor is used for measurement of high accuracy DC current, DC leakage current. Adopt the latest CT technology and double magnetic shielding techniques. It is portable, clamp design, no need to disconnect the measured circuits, non-contact, safe and fast. It can be connected with industrial control equipment, data recorder, oscilloscope, high precision digital multi-meter, etc. Widely applied in electricity, communication, meteorology, railway,

oilfield, construction, measurement, scientific and research teaching unit, industrial and mining enterprises.

II .Model

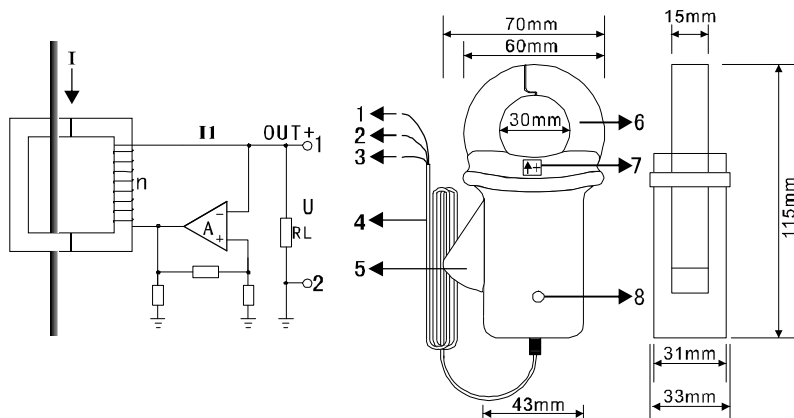
Model	Measurement Range	Resolution
ETCR 030D1	0-100mA DC	0.1mA DC
ETCR 030D	0-10A DC	10mA DC

III. Technical Specifications

Function	Measurement of DC current, DC leakage current
Test mode	Clamp CT
Power Supply	9V DC
Rated Power	2mW
Clamp Size	25mm×30mm
Range	0-100mA DC or 0-10A DC optional
Resolution	0.1mA DC or 10mA DC optional
Accuracy	±3.0%FS(23℃±2℃, below 70%RH, keep the wire be in the center of clamp)
Coils Turn	1: 800
Signal Output	2.5mV/1mA (0-1A/0-2.5V)
Output Interface	Red wire: positive power input; Yellow wire: ground; White wire: positive signal output
Output Wire Length	2m
Geomagnetic interference	About 3mA
Measured Wire Position	Approximately in the geometric center of the clamp
Line Voltage	Under 600V DC measurement
Dimension	115mm×70mm×33mm
Weight	180g
Working Environment	-15℃-45℃; below 80%rh
Storage Environment	-10℃-60℃; below 70%rh
Insulation Strength	AC3700V/rms (between core and shell)
Safety Rules	IEC1010-1, IEC1010-2-032, Pollution degree 2, CAT III(600V)

IV. Principle and Structure

The sensor induced output a current **I₁**, the current **I₁** generate voltage **U** on the external sampling load resistance **R_L**, so the measured current **I** can be calculated by measuring **U**. Output voltage 0-2.5V.



- | | |
|--|-------------------------|
| 1. Positive signal voltage output (white wire) | 2. Ground (yellow wire) |
| 3. Positive power input (red wire) | 4. Output wire (2m) |
| 5. Trigger (open and close the clamp) | 6. Clamp |
| 7. DC current positive input indicator | 8. Power indicator |

ETCR035AD Clamp AC/DC Current Sensor

I. Introduction

ETCR035AD Clamp AC/DC Current Sensor is used for measurement of AC/DC current, phase, power energy, power, power factor. Adopt the latest CT technology, without any bare metal conductor on clamp. It is portable, clamp design, no need to disconnect the measured circuits, non-contact, safe and fast. The clamp core is made of special alloy, to ensure the high precision, high stability and high reliability of perennial uninterrupted measurement. It can be connected with phase detection analyzer, industrial control equipment, data recorder, oscilloscope, harmonic analyzer, electric power quality analyzer, high precision digital multi-meter, etc. Widely applied in electricity, communication, meteorology, railway, oilfield, construction, measurement, scientific and research teaching unit, industrial and mining enterprises.

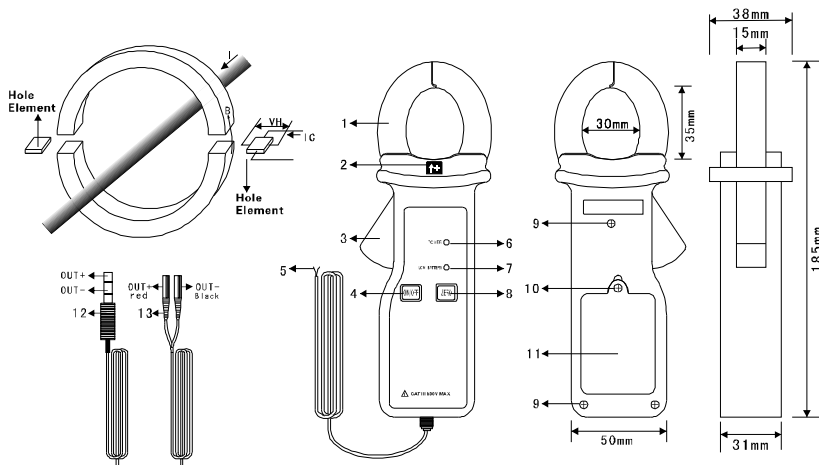
II. Technical Specifications

Function	Measurement of AC/DC current, phase, power energy, power, power factor
Power Supply	Zn-Mn dry battery, 6F22 9VDC (can connect external power supply)
Rated Power	5mW
Test mode	Clamp CT
Clamp Size	30mm×35mm

Range	0-600A AC/DC
Resolution	0.1A AC/DC
Signal Output	1mV/1A (0-600A/0-600mV DC/AC)
Accuracy	$\pm 1.0\%FS(23^{\circ}C \pm 2^{\circ}C, \text{ below } 70\%RH, \text{ keep the wire be in the center of clamp})$
Phase Error	$\leq 3^{\circ}(AC \text{ } 50Hz/60Hz; 23^{\circ}C \pm 2^{\circ}C)$
Zero Clearing	Press ZERO button to clearing, eliminate the influence of magnetic field on the DC testing
Output Wire Connection	Standard connection: Red wire: positive signal output; Yellow wire: negative signal output
Output Wire Length	2m
Measured Wire Position	Approximately in the geometric center of the clamp
Frequency Response	AC 45Hz-400Hz
Line Voltage	Under 600V DC measurement
Battery Voltage	LED lights up indicating low power when the battery voltage decrease to 7.2V. Then the battery have to be changed
Dimension	122mm×70mm×33mm
Weight	180g (with battery)
Working Environment	-15°C-45°C; below 80%rh
Storage Environment	-10°C-60°C; below 70%rh
Insulation Strength	AC3700V/rms (between core and shell)
Safety Rules	IEC1010-1, IEC1010-2-032, Pollution degree 2, CAT III(600V)

III. Principle and Structure

Combining partition type iron core with hall element, makes it capable of measuring AC current and DC current simultaneously. The hall element induced output a hall voltage **VH**, which is generate by the measured current **I**, so the measured current **I** can be calculated by measuring **VH**. Signal Output: 1mV/1A (input every 1A current, output 1mV voltage).



1. Clamp
2. DC current positive input indicator
3. Trigger (open and close the clamp)
4. **ON/OFF** button, power key
5. Standard output wire: (red wire: positive output signal; yellow: negative output signal)
6. Power on indicator
7. Low battery voltage indicator
8. **ZERO** clearing button
9. Cover connection screw (3 pcs)
10. Battery cover fixed screw
11. Battery cover
12. Sensor output plug (3.5mm audio plug, optional)
13. Sensor output plug (Standard multimeter plug, optional)

ETCR040 High Accuracy Clamp AC Leakage Sensor

I . Introduction

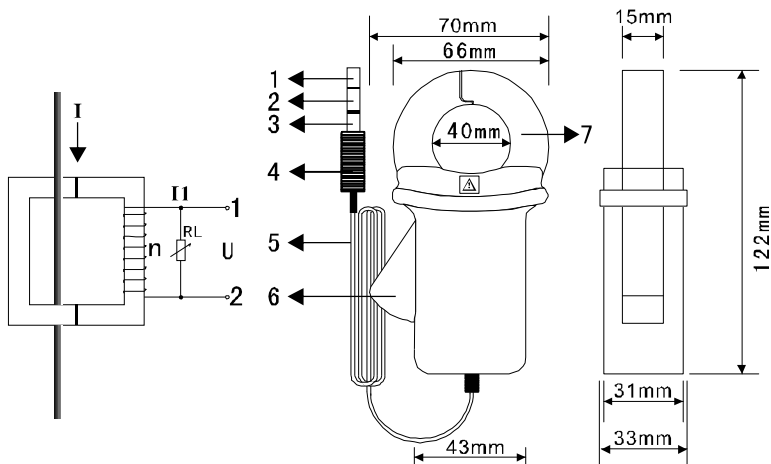
ETCR040 High Accuracy Clamp AC Leakage Sensor is used for measurement of high accuracy AC current, leakage current, high order harmonic current, phase, power energy, power, power factor. Adopt the latest CT technology. It is portable, clamp design, no need to disconnect the measured circuits, non-contact, safe and fast. The clamp core is made of special alloy, adopt the double magnetic shielding techniques, can almost shield the influence from external magnetic field, to ensure the high precision, high stability and high reliability of perennial uninterrupted measurement. It can be connected with phase detection analyzer, industrial control equipment, data recorder, oscilloscope, harmonic analyzer, electric power quality analyzer, high precision digital multi-meter, etc. Widely applied in electricity, communication, meteorology, railway, oilfield, construction, measurement, scientific and research teaching unit, industrial and mining enterprises.

II. Technical Specifications

Function	Measurement of AC current, leakage current, high order harmonic current, phase, power energy, power, power factor
Test mode	Clamp CT
Clamp Size	35mm×40mm
Range	0-300A AC
Resolution	0.01mA AC
Accuracy	±1.0%FS(50Hz/60Hz; 23°C±2°C, below 70%RH, keep the wire be in the center of clamp)
Coils Turn	1: 2500
Phase Error	≤2°(50Hz/60Hz; 23°C±2°C)
Reference Load	RL: 0-300mA≤500ohm; 0-3A≤50ohm; 0-30A≤5ohm; 0-300A≤0.5ohm
Output Mode	Current induction output
Output Interface	3.5mm audio plug
Output Wire Length	2m
Electric Field Interference	About 10mA when the external electric field 100A, 10mm nearby
Measured Wire Position	Approximately in the geometric center of the clamp
Current Frequency	45H-60Hz(when measuring big current)
Frequency Characteristics	10H-100kHz
Dimension	120mm×70mm×33mm
Weight	190g
Working Environment	-20°C-50°C; below 80%rh
Storage Environment	-10°C-60°C; below 70%rh
Insulation Strength	AC3700V/rms (between core and shell)
Safety Rules	IEC1010-1, IEC1010-2-032, Pollution degree 2, CAT III(600V)

III. Principle and Structure

The sensor induced output a current I_1 , the current I_1 generate voltage U on the external sampling load resistance R_L , so the measured current I can be calculated by measuring I_1 or U . Among them, $I=n \times I_1$; $U=I_1 \times R_L$. n is the coils turn (current ratio).



- | | | |
|--|------------------------|---------------------|
| 1. Coil tap | 2. Coil tap | 3. Shielding ground |
| 4. Sensor output plug (3.5mm audio plug) | 5. Output wire (2.5mm) | |
| 6. Trigger (open and close the clamp) | 7. Clamp | |

ETCR033H High Voltage Clamp Current Sensor

I. Introduction

ETCR033H High Voltage Clamp Current Sensor break through the traditional structure, specially designed for online measurement of high / low voltage current, leakage current, high order harmonic current, variable ratio, phase, power energy, power, power factor. Adopt the latest CT and shielding technology. It is portable, clamp design, no need to disconnect the measured circuits, non-contact, safe and fast, ensures high-precision, high-reliability and high stability for year-round uninterrupted testing.

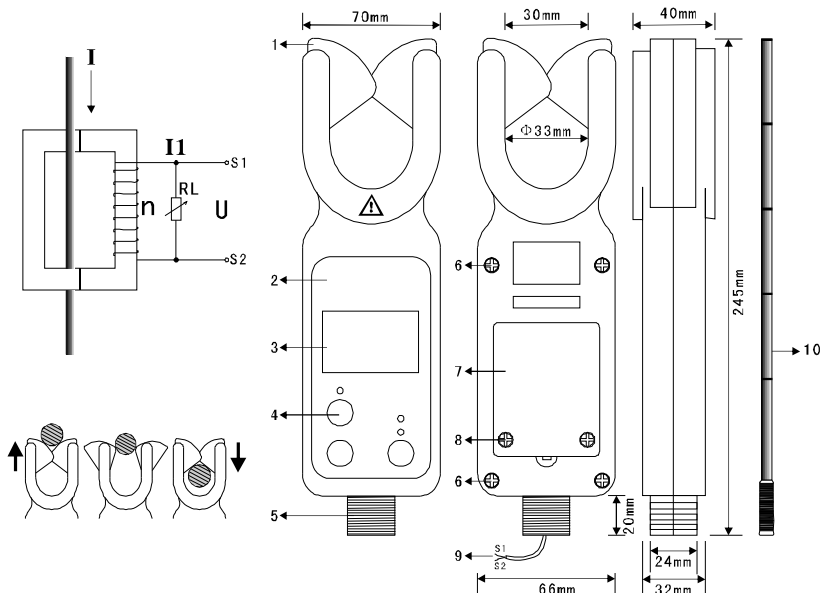
The innovation integrated design of pliers and boot sector, with automatic switching structure. Keep the wire be in the center of clamp, push the sensor to clamp the measured wire, while pull the sensor to withdraw the measured wire. The sensor can use together with insulation rods for high voltage testing up to 110KV, such as zinc oxide lighting arrester meter, high voltage clamp current meter, high voltage current transformation tester. It can also be connected with phase detection analyzer, industrial control equipment, data recorder, oscilloscope, harmonic analyzer, electric power quality analyzer, high precision digital multi-meter, etc. It is widely applied in electricity, communication, meteorology, railway, oilfield, construction, measurement, scientific and research teaching unit, industrial and mining enterprises.

II. Technical Specifications

Function	Measurement of high / low voltage current, leakage current, high order harmonic current, variable ratio, phase, power energy, power, power factor.
Battery Container	Can accommodate 4 pieces alkaline dry battery (1.5V AAA), supply power for further-development.
Clamp Mode	Clamp CT
Output Mode	Current induction, coil tap output (S1, S2)
Clamp Size	Diameter 33mm
Range	0-600A AC
Resolution	0.01mA AC
Accuracy	$\pm 1.0\%FS$ (50Hz/60Hz; $23^{\circ}C \pm 2^{\circ}C$, below 70%RH, keep the wire be in the center of clamp)
Coils Turn	1:4000
Phase Error	$\leq 3^{\circ}$ (50Hz/60Hz; $23^{\circ}C \pm 2^{\circ}C$)
Reference Load	RL: 0-1A \leq 500 Ω ; 0-10A \leq 50 Ω ; 0-100A \leq 5 Ω ; 0-1000A \leq 0.5 Ω
Output Wire	Length of 10cm, can connect it after open the cover.
Electric Field Interference	About 10mA when the external electric field 100A, 10mm nearby
Measured Wire Position	Keep the wire be in the center of clamp
Current Frequency	45Hz-60Hz(measured current frequency)
Frequency Characteristics	10Hz-100kHz
Circuit Voltage	High voltage testing up to 110KV (operate with insulation rods)
Dimension	245mm \times 70mm \times 40mm
Weight	210g
Working Environment	-20 $^{\circ}C$ -50 $^{\circ}C$; below 80%rh
Storage Environment	-10 $^{\circ}C$ -60 $^{\circ}C$; below 70%rh
Structure	Anti-dripping II
Insulation Strength	AC 3700V/rms (between core and shell)
Safety Rules	IEC1010-1, IEC1010-2-032, Pollution degree 2, CAT III(600V)

III. Principle and Structure

The sensor induced output a current I_1 , the current I_1 generate voltage U on the external sampling load resistance R_L , so the measured current I can be calculated by measuring I_1 or U . Among them, $I=n \times I_1$; $U=I_1 \times R_L$. n is the coils turn (current ratio).



1. Clamp (including boot sector)
2. Paster area for further-development
3. Display window for further-development
4. Used for button or indicator
5. Insulation rod connector
6. Cover connection screw
7. Battery cover
8. Battery cover fixed screw
9. Output wire (hidden inside the box)
10. Insulation rods 5m (optional)

ETCR048H High Voltage Clamp Current Sensor

I. Introduction

ETCR048H High Voltage Clamp Current Sensor break through the traditional structure, specially designed for online measurement of high / low voltage current, leakage current, high order harmonic current, variable ratio, phase, power energy, power, power factor. Adopt the latest CT and shielding technology. It is portable, clamp design, no need to disconnect the measured circuits, non-contact, safe and fast, ensures high-precision, high-reliability and high stability for year-round uninterrupted testing.

The innovation integrated design of pliers and boot sector, with automatic switching structure. Keep the wire be in the center of clamp, push the sensor to clamp the measured wire, while pull the sensor to withdraw the measured wire. The sensor can use together with insulation rods for high voltage testing up to 110KV, such as zinc oxide lighting arrester meter, high voltage clamp current meter, high voltage current transformation tester. It can also

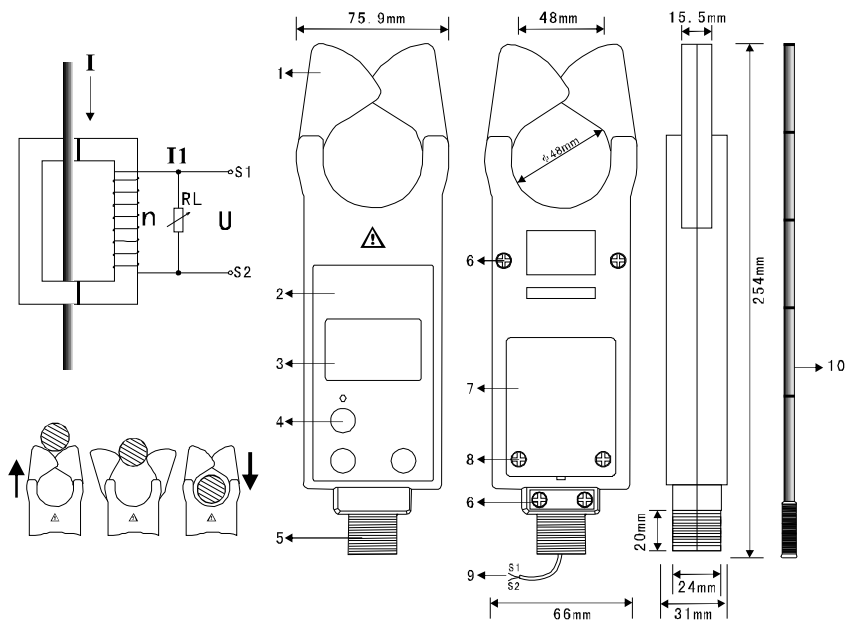
be connected with phase detection analyzer, industrial control equipment, data recorder, oscilloscope, harmonic analyzer, electric power quality analyzer, high precision digital multi-meter, etc. It is widely applied in electricity, communication, meteorology, railway, oilfield, construction, measurement, scientific and research teaching unit, industrial and mining enterprises.

II. Technical Specifications

Function	Measurement of high / low voltage current, leakage current, high order harmonic current, variable ratio, phase, power energy, power, power factor.
Battery Container	Can accommodate 4 pieces alkaline dry battery (1.5V AAA), supply power for further-development.
Clamp Mode	Clamp CT
Output Mode	Current induction, coil tap output (S1, S2)
Clamp Size	Diameter 48mm
Range	0-1000A AC
Resolution	0.1mA AC
Accuracy	$\pm 1.0\%FS$ (50Hz/60Hz; $23^{\circ}C \pm 2^{\circ}C$, below 70%RH, keep the wire be in the center of clamp)
Coils Turn	1:4000
Phase Error	$\leq 3^{\circ}$ (50Hz/60Hz; $23^{\circ}C \pm 2^{\circ}C$)
Reference Load	RL: 0-1A \leq 500 Ω ; 0-10A \leq 50 Ω ; 0-100A \leq 5 Ω ; 0-1000A \leq 0.5 Ω
Output Wire	Length of 10cm, can connect it after open the cover.
Electric Field Interference	About 10mA when the external electric field 100A, 10mm nearby
Measured Wire Position	Keep the wire be in the center of clamp
Current Frequency	45Hz-60Hz(measured current frequency)
Frequency Characteristics	10Hz-100kHz
Circuit Voltage	High voltage testing up to 110KV (operate with insulation rods)
Dimension	245mm \times 70mm \times 40mm
Weight	210g
Working Environment	-20 $^{\circ}C$ -50 $^{\circ}C$; below 80%rh
Storage Environment	-10 $^{\circ}C$ -60 $^{\circ}C$; below 70%rh
Structure	Anti-dripping II
Insulation Strength	AC 3700V/rms (between core and shell)
Safety Rules	IEC1010-1, IEC1010-2-032, Pollution degree 2, CAT III(600V)

III. Principle and Structure

The sensor induced output a current I_1 , the current I_1 generate voltage U on the external sampling load resistance R_L , so the measured current I can be calculated by measuring I_1 or U . Among them, $I=n \times I_1$; $U=I_1 \times R_L$. n is the coils turn (current ratio).



1. Clamp (including boot sector)
2. Paster area for further-development
3. Display window for further-development
4. Used for button or indicator
5. Insulation rod connector
6. Cover connection screw
7. Battery cover
8. Battery cover fixed screw
9. Output wire (hidden inside the box)
10. Insulation rods 5m (optional)

ETCR080/080A Large Caliber Clamp Leakage Current /Current Sensor

I .Introduction

ETCR080/080A Large Caliber Clamp Leakage Current / Current Sensor is well designed and manufactured for measurement of AC current, higher harmonic current, phase, electric energy, power and power factor, by adopting the latest CT technology. Its large caliber 80mm×80mm can clamp electric cable of Φ80mm, or 96mm×4mm flat cable and steel earth wires. It is portable, clamp designed, no need to disconnect the circuit, non-contact measurement, which means safer and faster. It can be connected with

phase detection analyzer, industrial control equipment, data recorder, oscilloscope, electric power quality analyzer, high precision multi-meter, widely applied in those fields as electricity, communications, meteorology, railroad, oilfield, construction, measurement, scientific & research teaching institutes, industrial and mining establishments.

ETCR080 Large Caliber Clamp Current Sensor's clamp core is made of special alloy, adopt the double magnetic shielding techniques, can almost shield the influence from external magnetic field, to ensure the high precision, high stability and high reliability of perennial uninterrupted measurement.

II. Model

Model	Range	Resolution	Note
ETCR080	0-2000A	0.01mA	With shielding function, can measure leakage current
ETCR080A	0-2500A	0.1A	Without shielding function

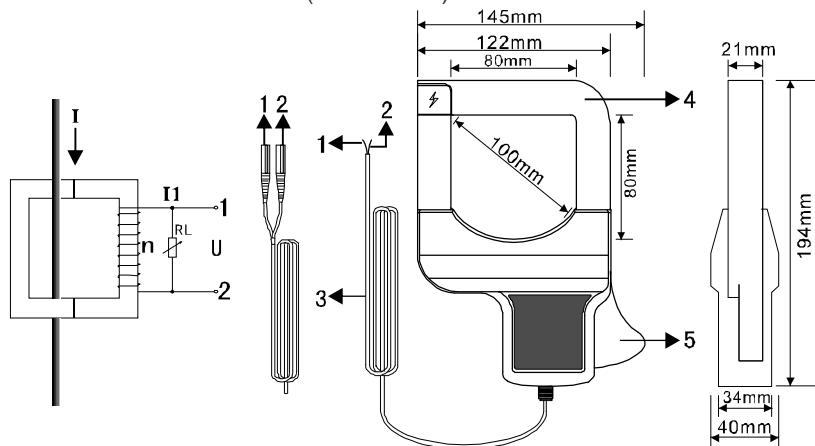
II. Technical Specifications

Function	Measurement of AC current, higher harmonic current, phase, electric energy, power and power factor
Test Mode	Clamp CT
Clamp Size	80mm×80mm
Measurement Range	AC 0-2000A or AC 0-2500A optional
Resolution	0.01mA or AC 0.1A optional
Accuracy	±1.0%FS (50Hz/60Hz; 23°C±2°C, below 70%RH, keep the measured wire be in the center of the clamp)
Coils Turn	1000: 1 (2000:1 and 3000:1 is optional)
Phase Error	≤3°(50Hz/60Hz; 23°C±2°C)
Reference Load	RL: 0-2500A≤0.3Ω
Output Mode	Current induction output
Output Interface	2 bare wires or standard multi-meter pen plug
Lead length	2m
Wire Position	Keep the measured wire be in the center of the clamp
Current Frequency	45Hz-60Hz (Frequency of the measured current)
	10Hz-100kHz
Circuit Voltage	Below 600V AC
Size	Length 194mm × Width 145mm × Height 40mm
Weight	780g
Working Temperature and Humidity	-20°C-50°C, below 80%rh

Storage Temperature and Humidity	-10℃-60℃, below 70%rh
Insulation strength	AC3700V/rms(between core and shell)
Safety Specifications	IEC1010-1, IEC1010-2-032, 2 class of pollution, CAT III(600V)

III. Principle and Structure

The sensor induced output a current I_1 , the current I_1 generate voltage U on the external sampling load resistance RL , so the measured current I can be calculated by measuring U . Output voltage 0-2.5V. Among them, $I = n \times I_1$; $U = I_1 \times RL$. n is the coils turn (current ratio).



1. Coil tap 2. Coil tap 3. Lead wire (2m) 4. Clamp
5. Trigger (open and close the clamp)
(Note: The coil tap can be bare wire or standard multi-meter plug)

ETCR080D Large Caliber Clamp DC Current Sensor

I. Introduction

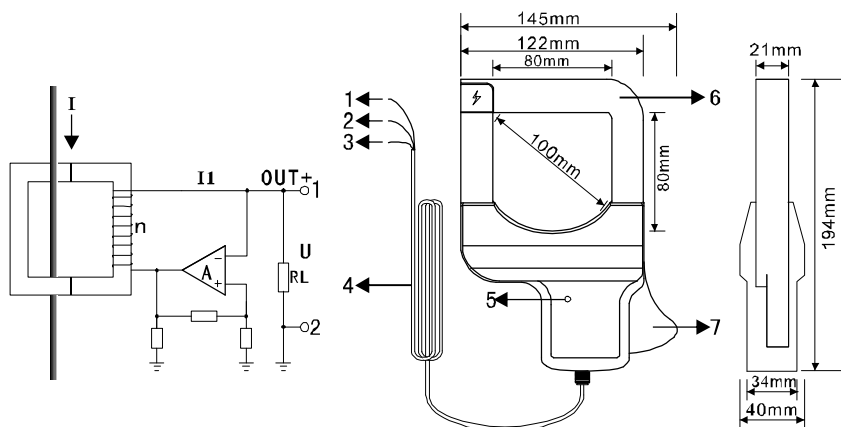
ETCR080D Large Caliber Clamp DC Current Sensor is used for measurement of high accuracy DC current, leakage current. Adopt the latest CT technology and shielding technology. It is portable, clamp design, no need to disconnect the measured circuits, non-contact, safe and fast, can be connected with industrial control equipment, data recorder, oscilloscope, high precision digital multi-meter, etc. Widely applied in electricity, communication, meteorology, railway, oilfield, construction, measurement, scientific and research teaching unit, industrial and mining enterprises.

II. Technical Specifications

Function	Measurement of DC current, leakage current
Test mode	Clamp CT
Power Supply	9V DC
Rated Power	2mW
Clamp Size	80mm×80mm
Range	0-10A DC
Resolution	10mA DC
Accuracy	±3.0%FS(50Hz/60Hz; 23°C±2°C, below 70%RH, keep the wire be in the center of clamp)
Coils Turn	1: 800
Signal Output	2.5mV/10mA (0-10A/0-2.5V)
Output Interface	Red wire: positive power input; Yellow wire: ground; White wire: positive signal output
Output Wire Length	2m
Measured Wire Position	Approximately in the geometric center of the clamp
Line Voltage	Under 600VDC measurement
Dimension	194mm×145mm×40mm
Weight	780g
Working Environment	-15°C-45°C; below 80%rh
Storage Environment	-10°C-60°C; below 70%rh
Insulation Strength	AC3700V/rms (between core and shell)
Safety Rules	IEC1010-1, IEC1010-2-032, Pollution degree 2, CAT III(600V)

III. Principle and Structure

The sensor induced output a current **I₁**, the current **I₁** generate voltage **U** on the external sampling load resistance **R_L**, so the measured current **I** can be calculated by measuring **U**. Output voltage 0-2.5V.



- | | |
|--|-------------------------|
| 1. Positive signal voltage output (white wire) | 2. Ground (yellow wire) |
| 3. Positive power input (red wire) | 4. Output wire (2m) |
| 5. Trigger (open and close the clamp) | 6. Clamp |
| 7. Trigger (open and close the clamp) | 8. Power indicator |

ETCR085K Clamp Type High Accuracy Leakage Current Sensor

I. Introduction

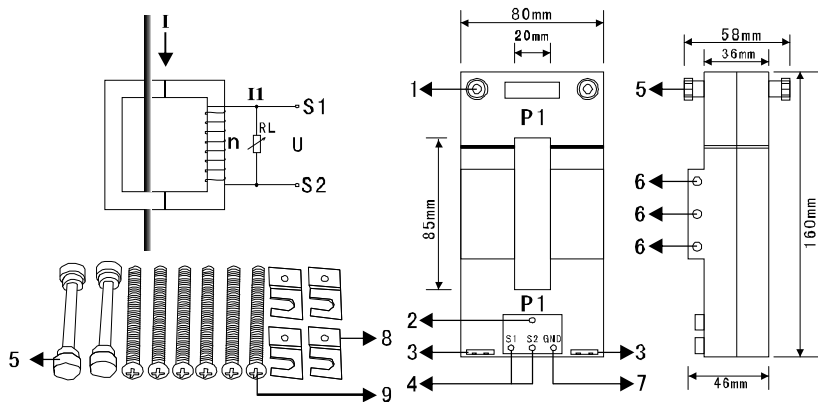
ETCR085K Clamp Type High Accuracy Leakage Current Sensor is widely applied in electricity, communication, meteorology, railway, oilfield, construction, measurement, scientific and research teaching unit, industrial and mining enterprises. It is used for measurement of high accuracy AC current, leakage current, high order harmonic current, frequency, phase, power, power energy, etc. It can be connected with high precision digital multi-meter, data recorder, electric power quality analyzer, oscilloscope, industrial control instrument, etc. Adopting the clamp type design, clamp size is 85mm×20mm, suitable for steel earth places (transformer grounding, substation grounding, high voltage tower grounding), no need to disconnect the measured circuits, makes it safe and convenient for field testing and maintenance. The clamp adopts the latest CT technology and four layer shielding technology, can almost shield the influence from external magnetic field, with ability of waterproof, rainproof, anti-drip, to ensure the high precision, high stability and high reliability of perennial uninterrupted measurement. Meanwhile, customizing is acceptable for more uses.

II. Technical Specifications

Function	Measurement of high accuracy AC current, leakage current, high order harmonic current, frequency, phase, power, power energy
Opening Type	Clamp type
Shielding Layer	Four layer shielding, can almost shield the influence from external magnetic field
Clamp Size	85mm×20mm
Output Interface	S1, S2---coil tap, GND---shielding ground
Coils Turn	1000 : 1
Input Range	AC 0.00Ma-100.0A
Resolution	0.01mA
Induced Output	1mA/1A
Accuracy	±1.0%FS(50Hz/60Hz; 23℃±2℃, below 70%RH, keep the wire be in the center of clamp)
Phase Error	≤2°(50Hz/60Hz; 23℃±2℃)
Line Voltage	Below AC 600V line measurement
Current Frequency	45Hz-60Hz (the measured current frequency)
Frequency Characteristics	10Hz-100KHz
Dimension	160mm×80mm×58mm
Weight	900g
Installation Direction	P1 side is upward
Electric Field Interference	About 10mA when the external electric field 100A, 10mm nearby
Measured Wire Position	Approximately in the geometric center of the clamp
Installation Type	2 types (against the wall or steel grounding wire)
Working Temperature and Humidity	-20℃-50℃, below 80%rh
Storage Temperature and Humidity	-10℃-60℃, below 70%rh
Structure	Drip tight II, rainproof
Insulation Strength	AC3700V/rms (between core and shell)
Safety Specifications	IEC1010-1, IEC1010-2-032, 2 class of pollution, CAT III(600V)

III. Principle and Structure

The sensor induced output a current I_1 , the current I_1 generate voltage U on the external sampling load resistance R_L , so the measured current I can be calculated by measuring I_1 or U . Among them, $I=n \times I_1$; $U=I_1 \times R_L$. n is the coils turn (current ratio).



1. Fixing screw hole
2. Screws on wire connecting cover
3. Hole for installing against the wall (with accessories 8)
4. Output lead wire interface
5. Fixing screw (2pcs)
6. Hole for installing against the steel grounding wire (with accessories 9)
7. Shielding ground
8. Accessories for installing against the wall (4pcs)
9. Accessories for installing against the steel grounding wire (6pcs)

ETCR148/148A Super-large Caliber Clamp Leakage Current / Current Sensor

I. Introduction

ETCR148/148A Super-large Caliber Clamp Leakage Current / Current Sensor is well designed and manufactured for measurement of AC leakage current, leakage current, higher harmonic current, phase, frequency, power and electric energy, by adopting the latest CT technology. Its large caliber 148mm×108mm can clamp electric cable of Φ108mm, or 160mm×4mm flat cable and steel earth wires. It is portable, clamp designed, no need to disconnect the circuit, non-contact measurement, which means safer and faster. It can be connected with phase detection analyzer, industrial control equipment, data recorder, oscilloscope, electric power quality analyzer, high precision multi-meter, widely applied in those fields as electricity, communications, meteorology, railroad, oilfield, construction, measurement, scientific&research teaching institutes, industrial and mining establishments. The clamp of ETCR148 is made of special alloy, adopt the latest CT and magnetic shielding techniques, can almost shield the influence from external

magnetic field, to ensure the high precision, high stability and high reliability of perennial uninterrupted measurement.

II. Model

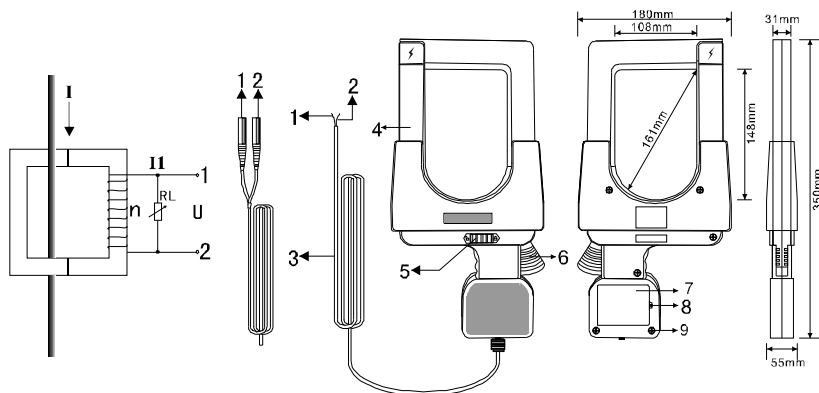
Model	Range	Resolution	Note
ETCR148	0-3000A	0.1mA	With shielding function, can measure leakage current
ETCR148A	0-4000A	0.1A	Without shielding function, can measure big current

III. Technical Specifications


Function	Measurement of AC current, higher harmonic current, phase, electric energy, power and power factor
Test Mode	Clamp CT
Clamp Size	148mm×108mm
Measurement Range	0-3000A / 0-4000A (optional)
Resolution	0.1mA / 0.1A
Accuracy	±2.0%FS (50Hz/60Hz; 23°C±2°C, below 70%RH, keep the measured wire be in the center of the clamp)
Coils Turn	3000: 1
Phase Error	≤3°(50Hz/60Hz; 23°C±2°C)
Reference Load	RL: 0-300mA≤3kΩ; 0-30A≤30Ω; 0-4000A≤0.3Ω
Output Mode	Current induction output
Output Interface	2 bare wires or standard multi-meter pen plug
Lead length	2m
Electric Field Interference	About 5mA when the external electric field 100A, 10mm nearby
Wire Position	Keep the measured wire be in the center of the clamp
Current Frequency	45Hz-60Hz (Frequency of the measured current)
	10Hz-100kHz
Circuit Voltage	Below 600V AC
Size	Length 350mm × Width 180mm × Height 55mm
Weight	1.5kg
Working Temperature and Humidity	-20°C-50°C, below 80%rh
Storage Temperature and Humidity	-10°C-60°C, below 70%rh
Insulation strength	AC3700V/rms(between core and shell)
Safety Specifications	IEC1010-1, IEC1010-2-032, 2 class of pollution, CAT III(600V)

IV. Principle and Structure

The sensor induced output a current I_1 , the current I_1 generate voltage U on the external sampling load resistance R_L , so the measured current I can be calculated by measuring U . Output voltage 0-2.5V. Among them, $I = n \times I_1$; $U = I_1 \times R_L$. n is the coils turn (current ratio).



- 1. Coil tap 2. Coil tap 3. Lead wire (2m) 4. Clamp
 - 5. Lock switch (after lock, the clamp can't be open)
 - 6. Trigger (open and close the clamp) 7. Battery cover
 - 8. Battery cover screw (1 piece)
 - 9. Up and down cover connecting screws (6 pieces)
- (Note: The coil tap can be bare wire or standard multi-meter plug)

 **Manufactured by**

ETCR Electronic Technology Company

Address: F-3F, No.4 Pengshang Zhifu Road, Jiahe, Baiyun District, Guangzhou, Guangdong, China

Post Code: 510440

Tel: (86-20)62199556 62199553

Fax: (86-20)62199550

E-mail: info@etcr.cc

Website: www.etcr.cc